

COM 220



OFFICE OF THE DVC
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2024 /2025 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE MAIN EXAMINATION

COURSE CODE: COM 220

COURSE TITLE: SOFTWARE ENGINEERING I

DATE: 9TH APRIL 2025

TIME: 08:00 – 11:00 AM

INSTRUCTION TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF 4 PRINTED PAGES

PLEASE TURN OVER

MAIN EXAMINATION

Course Code---: Course Title-----COM 220 Software Engineering I-----

STREAM: BSc (Computer Science)

DURATION: 3 Hours

INSTRUCTIONS TO CANDIDATES

- i. Answer **ALL** questions from section A and any **THREE** from section B.
- ii. Maps and diagrams should be used whenever they serve to illustrate the answer.
- iii. Do not write on the question paper.

SECTION A (24 MARKS) COMPULSORY

QUESTION ONE

[12 MARKS]

- a)
- i) Define the term “Software Engineering” [2 marks]
 - ii) Outline the problems associated with the adhoc method of software development that resulted to the software crisis in 1960’s and explain how software engineering solves these problems. [5 marks]
 - iii) Software engineering in the 21st century faces THREE key challenges outline these challenges [3 marks]
 - iv) Explain ONE limitations of testing. [2 marks]

QUESTION TWO

[12 MARKS]

- a)
- i) What makes software engineering different from problem solving in other engineering fields and sciences? [4 Marks]
 - ii) How does software engineer deal with complexity in large projects? Outline any FOUR ways [4 marks]
 - iii) State TWO reasons for choosing a top-down process? [2 marks]
 - iv) Elaborate on Black box Testing [2 marks]

Section B: Answer Any THREE Questions in this section

QUESTION THREE

[12 MARKS]

- a)
- i) What is a software *process* in software engineering context [2 marks]
 - ii) Outline the FOUR Fundamental activities in all software processes [2 marks]
 - iii) What distinguishes a non-functional requirement from a functional requirement? Give an example of each. [4 marks]
 - iv) State the advantages of developing prototype of a system. [2 marks]
 - v) Identify TWO characteristics that are considered in the selection of a life cycle model? [2 marks]

QUESTION FOUR

[12 MARKS]

- a) Elegant Software Solutions has been employing the Build-And-Fix approach to software development for the past 3 years. This has resulted to several lawsuits for late delivery and poor quality software. To address this issue senior management has hired you as a quality assessment consultant to:
- i. Explain the source of the problem [4 marks]
 - ii. Document an alternative software development strategy. The proposed strategy must be fully explained, giving any inherent advantages and disadvantages. [8 marks]

QUESTION FIVE

[12 MARKS]

- a) You are required to design a software system for a voting machine, on which voters can see a list of candidates and select one to vote for. The machine should check that each voter is eligible to vote. The electoral registrar will also want to print a summary of the total votes for each candidate, and (separately) a list of the voters who have voted, and a list of those who haven't. In case of a dispute, the machine should also list a complete record of who voted for whom, but only a judge can use this function.
- i). Identify THREE actors in this scenario [3 marks]
 - ii). Identify FIVE use cases in the scenario [5 marks]
 - iii). Draw a Use Case Diagram for the scenario [4 marks]

QUESTION SIX

[12 MARKS]

- a)
- i). Specification documents often fail to describe the requirements clearly enough for the various people who need to read them. Describe THREE different types of mistakes made by specification authors. [3 marks]
 - ii). What are the advantages and disadvantages of interviews as a primary technique for eliciting stakeholder requirements? How might you overcome the disadvantages? [6 marks]
 - iii). Outline THREE Problems with Natural Language in requirement specification [3 marks]

QUESTION SEVEN

[12 MARKS]

- a)
- i). What is SDLC (Software Development Life Cycle?) [2 marks]
 - ii). Explain the difference between verification and validation. Give an example of a technique that can be used for each. [4 marks]
- b) Differentiate between the following types of requirements. [2 marks]
- i) Functional requirements and non-functional requirements
- c) Several modules of a software system were developed. It was noted that the modules were highly coupled. What problems are likely to arise? [4 marks]